

(12) UK Patent Application (19) GB (11) 2 194 081 (13) A

(43) Application published 24 Feb 1988

(21) Application No 8619360

(22) Date of filing 8 Aug 1986

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(51) INT CL⁴
G04G 1/00 G04C 3/14

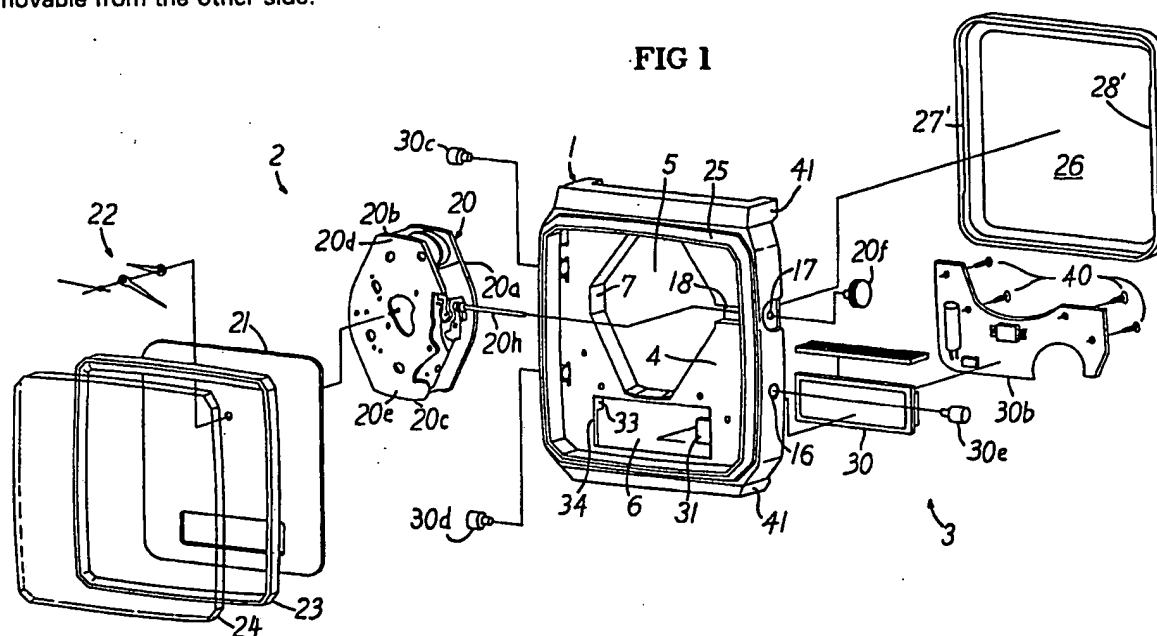
(52) Domestic classification (Edition J):
G3T 101 301 A2C AAA AAB QA QB

(56) Documents cited
None

(58) Field of search
G3T
Selected US specifications from IPC sub-classes G04C
G04G

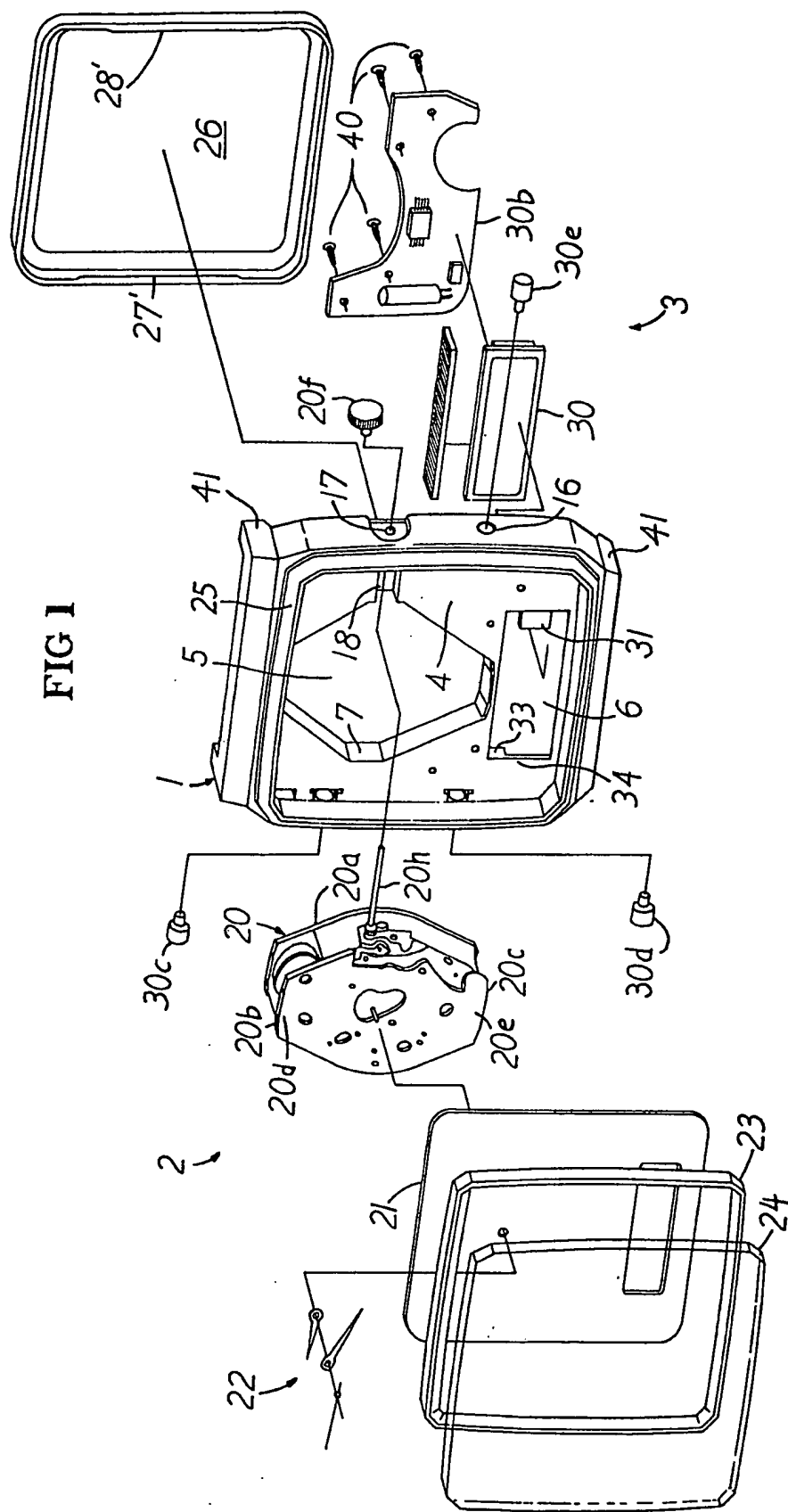
(54) Watchcase for analog-digital timepiece

(57) A watchcase for analog-digital timepiece comprising, in lieu of a timepiece housing frame and a middle case body, a member 1 formed as a one-piece moulding. The member is provided substantially at the center thereof with a first aperture means 5 for the accommodation of the watch movement of the analog timepiece 2 and a second aperture means 6 through which the liquid crystal display means 3 of the digital timepiece can be viewed. The member is so constructed that the watch movement of the analog timepiece is accessible and removable from one side of the watchcase whilst the digital timepiece is accessible and removable from the other side.



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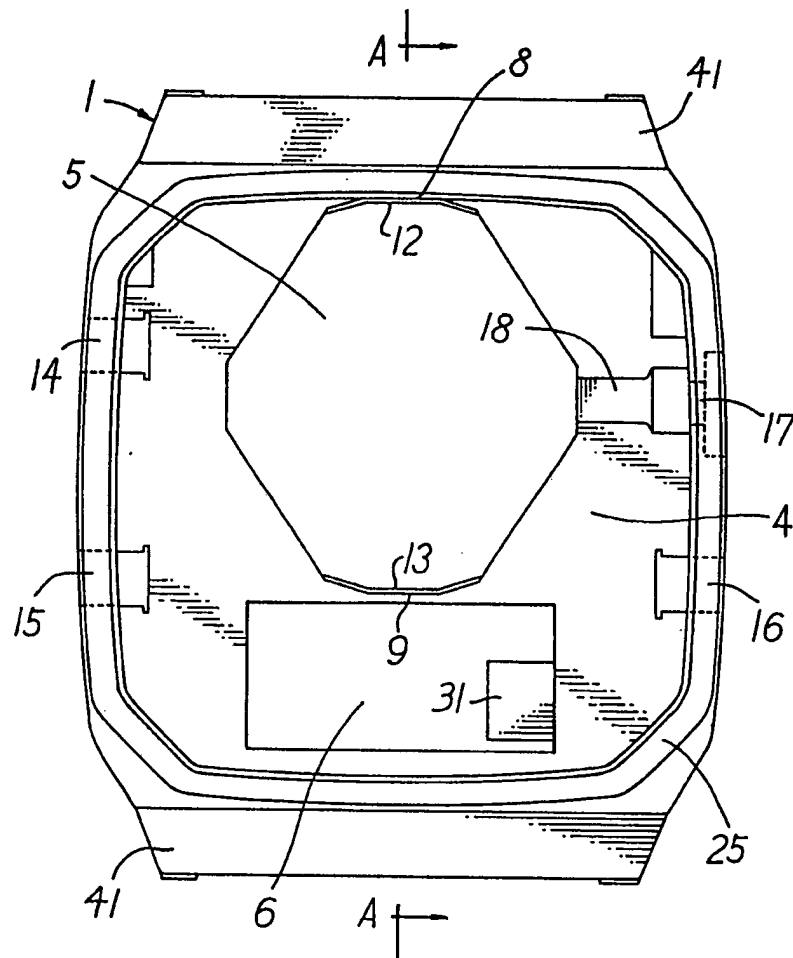


FIG 2

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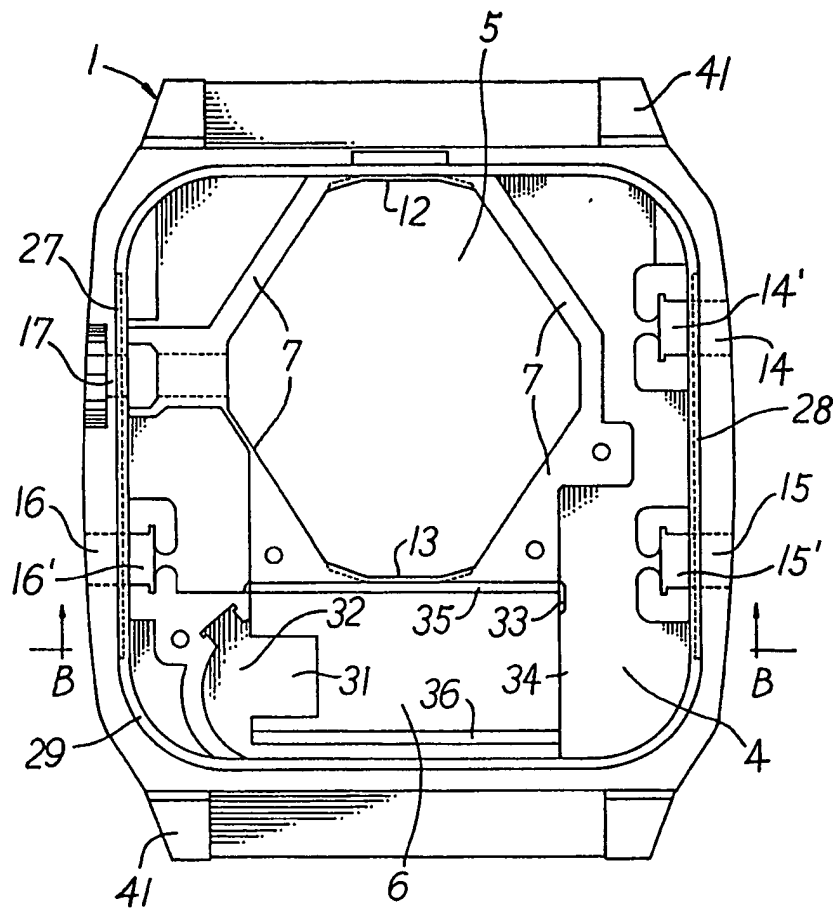


FIG 3

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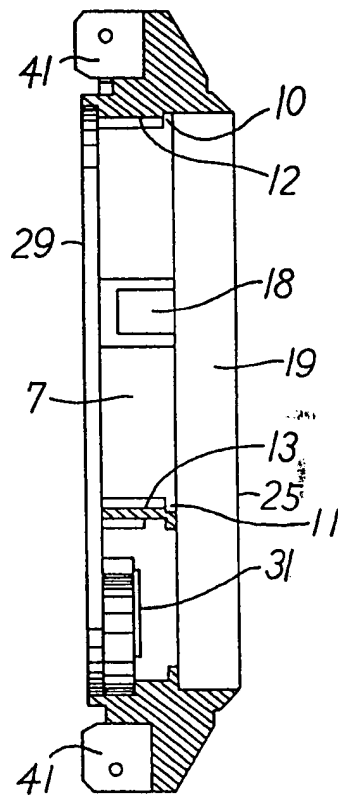


FIG 4

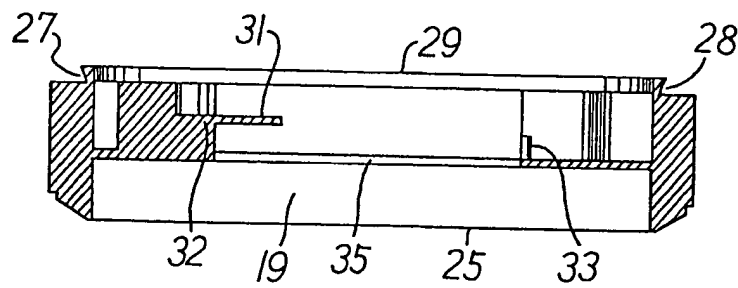


FIG 5

SPECIFICATION

Watchcase for analog-digital timepiece

5 The present invention relates to a watchcase of an analog-digital time piece and in particular to a watchcase having, in lieu of a middle case body and a timepiece housing frame, a member formed as a one-piece moulding for the incorporation of both an analog timepiece and a digital timepiece whereby dual time can be observed.

Analog-digital watches are known in prior art. Conventional analog-digital watches are generally composed of an analog timepiece, a digital timepiece for the measuring and displaying time and a watchcase for protection. The analog and digital timepieces are positioned in a timepiece support frame structure which is in turn disposed within a middle case body. Due to the large number of separate components must be needed to assemble the watch, assembly is considered to be rather difficult to perform. The analog and digital timepieces are so disposed that they are accessible and removable from one end, usually the rear end, of the watchcase. Replacement of a component (e.g. the battery of the digital timepiece) or repair of a part (e.g. Watch movement of the analog timepiece) will likely to invite contaminants or damages to the other components or parts of the timepieces. Hence, such prior art arrangement experienced some disadvantages and problems.

35 A further disadvantage of such prior art lies in the method by which the analog and digital timepieces are assembled. Since the orientation of the timepieces depends very much on each other and on the timepiece support frame structure as mentioned above, it is contemplated that the assembly of the analog and digital timepieces can be performed separately i.e. either to assemble the analog timepiece first and the digital timepiece next, or vice versa.

It is an object of the present invention to produce a watchcase for an analog-digital timepiece whereby the abovementioned disadvantages can be overcome.

50 According to the present invention, there is provided a watchcase for an analog-digital timepiece comprising, a one-piece member having a first aperture means provided substantially at the center thereof for the receiving and orienting of the Watch movement of the analog timepiece and a second aperture means disposed along one peripheral portion of the member and adjacent to the first aperture means for the mounting of the digital timepiece whereby the watch movement is accessible and removable from the front end of the watchcase and the digital timepiece is accessible and removable from the rear end of the watchcase.

65 The

aperture has the shape of a diamond having the angles of which being cut off or rounded off. The second aperture defining a display window for the liquid crystal display of the digital timepiece is rectangular in shape and is disposed below the first aperture means.

70 A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings wherein:

75 Figure 1 is a partial exploded view of the watchcase illustrating the characteristics that the analog and digital timepieces are accessible and removable from the front and rear ends of the watchcase respectively.

80 Figure 2 is a plan view of an embodiment of the one-piece member embodying the present invention.

Figure 3 is a rear view of the member as shown in Figure 2.

85 Figure 4 is a sectional view taken generally along line A-A of Figure 2.

Figure 5 is a sectional view taken generally along line B-B of Figure 3.

90 Referring now in more detail to the drawing in which like reference numerals represent like parts throughout the several views, Figure 1 shows a partial exploded view of the watchcase according to the present invention being incorporated with an analog timepiece and a digital timepiece.

95 Member 1 being moulded in one piece of plastic material defines a housing frame for the analog timepiece 2 and the digital timepiece 3 and a middle case body of the watchcase. Member 1 comprises a radial wall 4 having a first aperture 5 and a second aperture 6 provided thereon for the accommodation of an analog timepiece 2 and an digital timepiece 3 respectively so as to allow dual time observation.

100 Member 1 is provided substantially at the center thereof with a first aperture 5 adapted for receiving and orienting a watch movement 20. In the embodiment illustrated, the outline of the plan view of the watch movement 20 has the general shape of an olive with each of both ends being cut off at three adjacent portions thereof. The first aperture 5 has a shape conforming generally to the outline of the plan view of the watch movement 20. More specifically, the first aperture 5 is of diamond configuration with each of the two far angles being cut off at three adjacent portions giving rise to an irregular polygon, as best seen in Figure 2 and 3.

110 Axially extending means 7 are provided integrally along the perimeter of the first aperture 5 and projected backwardly from the radial wall 4. The axially extending means 7 terminates in a common plane substantially parallel to the radial wall 4 of the member 1. Axially extending means 7 defines an aperture peripheral wall against which the watch movement 20 is positioned.

125 The axially extending

means 7 extends along a distance slightly greater than the thickness of the watch movement 20 such that when the watch movement 20 is positioned in the first aperture 5, the metal side plate 20a of the watch movement 20 is disposed substantially in the same plane in which the free end of the axially extending means 7 terminates.

Figure 2 shows a plan view of the member 1 formed as a one piece moulding. The aperture edge portions designated by the reference numbers 8 and 9 are provided at the front part thereof with stepped recesses 10 and 11 for the receiving of corresponding flanges 20b and 20c of the watch movement 20 (see Figure 1). This renders orientation of the watch movement 20 relative to the member 1. Stop shoulders 12 and 13 are adapted for restraining axial movement of the watch movement 20 in one direction and for further abutment against the end portions of the watch movement 20.

The dimensions of the watch movement 20 is in general slightly smaller than the dimensions of the first aperture 5 so that the watch movement 20 can be suitably fitted into the aperture and held fast therein.

The dimensions of the first aperture is so selected that space are provided between the axially extending means 7 and respective opposite long side of watch movement so that removal of the watch movement 20 from the first aperture 5 can be facilitated.

Second cutout or aperture 6 is, in the case in the illustrated embodiment, disposed on the radial wall 4 along the bottom portion of member 1. The second aperture 6 being rectangular in shape is adapted to be used in cooperation with the digital timepiece 3 thereby rendering the time display means 30 of the digital timepiece 3 to be viewed therethrough.

It is, of course, appreciated that the second aperture 6 can be disposed directly above the first aperture 5, though the arrangement in the present embodiment is preferred for aesthetic reason.

With reference to Figure 2 and 3, borings 14, 15 and 16 are provided along the peripheral walls of the member 1 for the passage of control stems 30c, 30d and 30e therethrough (see Figure 1). Housings 14', 15' and 16' being made integral with the member 1 for the accommodation of metal contact plate (not shown) therein are disposed on the inner surfaces of the peripheral walls of member 1 and are adapted to be used in association with the respective borings 14, 15, and 16. Each of the Housings 14', 15' and 16' consists of arms extending inwardly in spaced relation from the peripheral wall with free ends projecting towards each other to define a compartment.

Boring 17 is

stem 20h which is engaged to watch movement 20.

Recess portion 18 is disposed between the first aperture 5 and the boring 17 for the receiving of part of the winding stem 20h thereby rendering watch movement 20 to be accessible and removable from the front side of member 1 of the watchcase.

Referring now to Figure 4, axially extending recess 19 being provided on the front side of member 1 is adapted to accommodate the dial 21, hands 22, spacer 23 and watch crystal 24. Projecting outwardly along the peripheral portion of the front surface of radial wall 4 is collar portion 25 which defines the sides of the recess 19.

Figure 5 shows a sectional view taken generally along line B-B of Figure 3. Watchcase back cover 26 is adapted to close off the back side of the member 1. Recessed grooves 27 and 28 are provided on the outer surface of two opposite sides of the skirt portion 29 into which projecting lugs 27' and 28' of back cover 26 (see Figure 1) of corresponding shape is snap-fitted in a snap action thereby closing off the rear side of member 1.

As best seen in Figure 3 and 5, tongue 31 projects laterally from portion 32 of radial wall 4 and flange 33 projects outwardly from edge portion 34 of radial wall 4. Elongated stepped recesses 35 and 36 are provided along the long sides of the second aperture 6. Tongue 31, flange 33 and stepped recesses 35 and 36 are adapted to hold the liquid crystal display means 30 into alignment with the second aperture 6 so as to render time on the time display means 30 to be viewed therethrough. The printed circuit board 30b together with the rest of the components of the digital timepiece 30 are then secured to the back of member 1 by means of screws 40.

When assembly the watch according to the present invention, digital timepiece 3 is secured to the rear side of the one-piece member 1. Control stems 30c, 30d and 30e are secured to borings 14, 15 and 16 respectively. Time display means 30 and metal contact plates (not shown) are inserted into prescribed position. Printed circuit board is mounted to the lower rear end of the member 1 by means of screws 40. Next the case back cover 26 is engaged to member 1 with a snap action. This completes the assembly of the digital timepiece 3 to the rear side of the watchcase.

Watch movement 20 is brought into place by initially inserting the winding stem 20h of watch movement 20 through the winding stem boring 17 such that the part of the stem close to the movement will be seated in the recess 18 whereas the watch movement 20 will be seated in the first aperture 5. Crown 20f is then connected to the free end of the dial 21 is laid

- mounted to the watch movement 20. Spacer 23 is then placed onto the front surface of dial 21 abutting against the inner surface of collar 25. Finally, the watch crystal 24 is snap-fitted to the recess portion defined by the upper surface of the Spacer 23 and the inner wall of collar 25. Assembly of the analog timepiece 2 to the front side of the watchcase is then completed.
- 10 The present invention is characterised by the feature that the one-piece member is provided with positioning aperture means whereby the analog timepiece is adapted to be removed or replaced from the one side of the watchcase and the digital timepiece from the other side of the watchcase. The advantage will be apparent by referring to the above description wherein it is contemplated that separate operation can be performed in respect of the analog part of the timepiece and the digital part of the timepiece such that operation on the analog part, as in the event of repair or cleaning, will not cause any undesired effect (e.g. damage, misplacement or contamination) to the digital part and vice versa. This eliminates problems experienced in prior art where delicate mechanical parts of the movement as well as the electronic components of the digital timepiece are usually simultaneously exposed when the case back cover of the watch is removed.
- 25 The member 1 further comprises strap carrying lugs 41 made integral with the member for the mounting of watch straps (not shown).
- 35 While the present invention has been shown and described with particular reference to a preferred embodiment thereof, it should be noted that various other changes or modifications may be made without departing from the scope of the present invention.
- 40

CLAIMS

1. A watchcase for an analog-digital timepiece comprising, in lieu of a timepiece support frame structure and a middle case body, a member formed as a one-piece moulding, said member having a first aperture means provided substantially at the center thereof whereby the watch movement of the analog timepiece is removably oriented therein from the front end of the watchcase and a second aperture means disposed along one peripheral portion thereof and adjacent said first aperture means whereby the digital timepiece is removably engaged thereto from the rear end of the watchcase.
2. A watchcase for an analog-digital timepiece as claimed in Claim 1, wherein said first aperture means comprising a cutout portion having axially extending flanges projecting backwardly along the periphery thereof.
3. A watchcase for an analog-digital timepiece as claimed in Claim 2, wherein said cutout portion is substantially of diamond shape with a
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4. A watchcase for an analog-digital timepiece as claimed in Claim 2 or Claim 3, wherein said cutout portion is substantially of diamond shape with angles of which being rounded off.

70 5. A watchcase for an analog-digital timepiece as claimed in Claim 1, wherein said second aperture means is disposed underneath said first aperture means.

6. A watchcase for an analog-digital timepiece as claimed in Claim 1, wherein said member is provided integrally with strap carrying lugs at opposite sides thereof for the mounting of watch straps.

7. A watchcase for an analog-digital timepiece as claimed in Claim 1, wherein orientation means are made integral with and provided on said member for the receiving of a winding stem and at least one control stems.

8. A watchcase for an analog-digital timepiece as claimed in any one of the preceding claims, wherein said member is of plastic material.

9. A watchcase for an analog-digital timepiece substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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